



#.C

templst

SEQUENCE LISTING

<110> Croce, Carlo
Brenner, Charles
Pekarski, Yuri

<120> CRYSTAL STRUCTURE OF WORM NitFhit
REVEALS THAT A Nit TETRAMER BINDS TWO Fhit DIMERS

<130> CR001.PCT07

<140> 09/855,294

<141> 2001-05-15

<150> 60/204,713

<151> 2000-05-16

<160> 11

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 276

<212> PRT

<213> Homo sapien

<400> 1

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			20					25					30		
Thr	Gln	Gly	Ala	Lys	Ile	Val	Ser	Leu	Pro	Glu	Cys	Phe	Asn	Ser	Pro
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Tyr	Gly	Ala	Lys	Tyr	Phe	Pro	Glu	Tyr	Ala	Glu	Lys	Ile	Pro	Gly	Glu
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Ser	Thr	Gln	Lys	Leu	Ser	Glu	Val	Ala	Lys	Glu	Cys	Ser	Ile	Tyr	Leu
65					70					75				80	
Ile	Gly	Gly	Ser	Ile	Pro	Glu	Glu	Asp	Ala	Gly	Lys	Leu	Tyr	Asn	Thr
			85						90					95	
Cys	Ala	Val	Phe	Gly	Pro	Asp	Gly	Thr	Leu	Leu	Ala	Lys	Tyr	Arg	Lys
			100					105					110		
Ile	His	Leu	Phe	Asp	Ile	Asp	Val	Pro	Gly	Lys	Ile	Thr	Phe	Gln	Glu
	115						120					125			
Ser	Lys	Thr	Leu	Ser	Pro	Gly	Asp	Ser	Phe	Ser	Thr	Phe	Asp	Thr	Pro
	130					135					140				
Tyr	Cys	Arg	Val	Gly	Leu	Gly	Ile	Cys	Tyr	Asp	Met	Arg	Phe	Ala	Glu
145					150					155				160	
Leu	Ala	Gln	Ile	Tyr	Ala	Gln	Arg	Gly	Cys	Gln	Leu	Leu	Val	Tyr	Pro
			165						170					175	
Gly	Ala	Phe	Asn	Leu	Thr	Thr	Gly	Pro	Ala	His	Trp	Glu	Leu	Leu	Gln
			180					185					190		
Arg	Ser	Arg	Ala	Val	Asp	Asn	Gln	Val	Tyr	Val	Ala	Thr	Ala	Ser	Pro
		195					200					205			
Ala	Arg	Asp	Asp	Lys	Ala	Ser	Tyr	Val	Ala	Trp	Gly	His	Ser	Thr	Val
	210					215					220				
Val	Asn	Pro	Trp	Gly	Glu	Val	Leu	Ala	Lys	Ala	Gly	Thr	Glu	Glu	Ala
225					230					235				240	
Ile	Val	Tyr	Ser	Asp	Ile	Asp	Leu	Lys	Lys	Leu	Ala	Glu	Ile	Arg	Gln
				245					250					255	

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Gln	Ile	Pro	Val	Phe	Arg	Gln	Lys	Arg	Ser	Asp	Leu	Tyr	Ala	Val	Glu
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Met	Lys	Lys	Pro												
		275													

<210> 2
 <211> 276
 <212> PRT
 <213> mouse

<400> 2

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			20					25					30		
Lys	Gln	Gly	Ala	Asn	Ile	Val	Ser	Leu	Pro	Glu	Cys	Phe	Asn	Ser	Pro
		35					40					45			
Tyr	Gly	Thr	Thr	Tyr	Phe	Pro	Asp	Tyr	Ala	Glu	Lys	Ile	Pro	Gly	Glu
	50					55					60				
Ser	Thr	Gln	Lys	Leu	Ser	Glu	Val	Ala	Lys	Glu	Ser	Ser	Ile	Tyr	Leu
65					70					75					80
Ile	Gly	Gly	Ser	Ile	Pro	Glu	Glu	Asp	Ala	Gly	Lys	Leu	Tyr	Asn	Thr
			85						90					95	
Cys	Ser	Val	Phe	Gly	Pro	Asp	Gly	Ser	Leu	Leu	Val	Lys	His	Arg	Lys
			100					105					110		
Ile	His	Leu	Phe	Asp	Ile	Asp	Val	Pro	Gly	Lys	Ile	Thr	Phe	Gln	Glu
		115					120					125			
Ser	Lys	Thr	Leu	Ser	Pro	Gly	Asp	Ser	Phe	Ser	Thr	Phe	Asp	Thr	Pro
	130					135					140				
Tyr	Cys	Lys	Val	Gly	Leu	Gly	Ile	Cys	Tyr	Asp	Met	Arg	Phe	Ala	Glu
145					150					155					160
Leu	Ala	Gln	Ile	Tyr	Ala	Gln	Arg	Gly	Cys	Gln	Leu	Leu	Val	Tyr	Pro
			165						170					175	
Gly	Ala	Phe	Asn	Leu	Thr	Thr	Gly	Pro	Ala	His	Trp	Glu	Leu	Leu	Gln
			180					185					190		
Arg	Ala	Arg	Ala	Val	Asp	Asn	Gln	Val	Tyr	Val	Ala	Thr	Ala	Ser	Pro
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Ala	Arg	Asp	Asp	Lys	Ala	Ser	Tyr	Val	Ala	Trp	Gly	His	Ser	Thr	Val
	210					215					220				
Val	Asp	Pro	Trp	Gly	Gln	Val	Leu	Thr	Lys	Ala	Gly	Thr	Glu	Glu	Thr
	225				230					235					240
Ile	Leu	Tyr	Ser	Asp	Ile	Asp	Leu	Lys	Lys	Leu	Ala	Glu	Ile	Arg	Gln
				245					250					255	
Gln	Ile	Pro	Ile	Leu	Lys	Gln	Lys	Arg	Ala	Asp	Leu	Tyr	Thr	Val	Glu
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Ser	Lys	Lys	Pro												
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<210> 3
 <211> 288
 <212> PRT
 <213> x. laevis

<400> 3

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			20					25					30		
Glu	Ala	Ala	Gly	Arg	Arg	Ala	Cys	Met	Val	Phe	Leu	Pro	Glu	Ala	Phe
		35					40					45			
Asp	Tyr	Ile	Gly	Gly	Ser	Ile	Glu	Glu	Thr	Leu	Ser	Leu	Ala	Glu	Ser

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										templst							
50					55					60							
Leu	His	Gly	Asp	Thr	Ile	Gln	Arg	Tyr	Thr	Gln	Leu	Ala	Arg	Glu	Cys		
65					70					75					80		
Gly	Leu	Trp	Leu	Ser	Leu	Gly	Gly	Phe	His	Glu	Lys	Gly	Pro	Asn	Trp		
				85					90					95			
Asp	Thr	Asp	Gln	Arg	Ile	Ser	Asn	Ser	His	Val	Val	Val	Asp	Asn	Thr		
			100					105					110				
Gly	His	Ile	Val	Ser	Val	Tyr	Arg	Lys	Ala	His	Leu	Phe	Asp	Val	Asp		
		115					120					125					
Leu	Gln	Asn	Gly	Val	Ser	Leu	Arg	Glu	Ser	Ser	Ser	Thr	Leu	Pro	Gly		
		130				135					140						
Ala	Glu	Leu	Ile	Arg	Pro	Ile	Thr	Ser	Pro	Ala	Gly	Lys	Ile	Gly	Leu		
145					150					155					160		
Gly	Val	Cys	Tyr	Asp	Leu	Arg	Phe	Pro	Glu	Phe	Ser	Leu	Ala	Leu	Ala		
				165					170					175			
Gln	Gln	Gly	Ala	Glu	Leu	Leu	Thr	Tyr	Pro	Ser	Ala	Phe	Thr	Leu	Thr		
			180					185					190				
Thr	Gly	Leu	Ala	His	Trp	Glu	Val	Leu	Leu	Arg	Ala	Arg	Ala	Ile	Glu		
		195				200						205					
Thr	Gln	Cys	Tyr	Val	Val	Ala	Ala	Gln	Thr	Asp	Arg	His	Asn	Glu			
		210				215				220							
Lys	Arg	Thr	Ser	Tyr	Gly	His	Ala	Met	Val	Val	Asp	Pro	Trp	Gly	Leu		
225					230					235					240		
Val	Ile	Gly	Gln	Cys	Gln	Glu	Gly	Thr	Gly	Ile	Cys	Tyr	Ala	Glu	Ile		
			245						250					255			
Asp	Ile	Pro	Tyr	Met	Glu	Arg	Val	Arg	Arg	Asp	Met	Pro	Val	Trp	Arg		
			260					265					270				
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<210> 4
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 <212> PRT
 <213> S. cerevisiae

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			20					25					30				
Ala	Ile	Gln	Lys	Lys	Ala	Asp	Val	Val	Phe	Leu	Pro	Glu	Ala	Ser	Asp		
		35				40					45						
Tyr	Leu	Ser	Gln	Asn	Pro	Leu	His	Ser	Arg	Tyr	Leu	Ala	Gln	Lys	Ser		
	50					55					60						
Pro	Lys	Phe	Ile	Arg	Gln	Leu	Gln	Ser	Ser	Ile	Thr	Asp	Leu	Val	Arg		
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Asp	Asn	Ser	Arg	Asn	Ile	Asp	Val	Ser	Ile	Gly	Val	His	Leu	Pro	Pro		
				85					90				95				
Ser	Glu	Gln	Asp	Leu	Leu	Glu	Gly	Asn	Asp	Arg	Val	Arg	Asn	Val	Leu		
			100					105					110				
Leu	Tyr	Ile	Asp	His	Glu	Gly	Lys	Ile	Leu	Gln	Glu	Tyr	Gln	Lys	Leu		
		115					120					125					
His	Leu	Phe	Asp	Val	Asp	Val	Pro	Asn	Gly	Pro	Ile	Leu	Lys	Glu	Ser		
		130				135					140						
Lys	Ser	Val	Gln	Pro	Gly	Lys	Ala	Ile	Pro	Asp	Ile	Ile	Glu	Ser	Pro		
145					150					155					160		
Leu	Gly	Lys	Leu	Gly	Ser	Ala	Ile	Cys	Tyr	Asp	Ile	Arg	Phe	Pro	Glu		
				165					170					175			
Phe	Ser	Leu	Lys	Leu	Arg	Ser	Met	Gly	Ala	Glu	Ile	Leu	Cys	Phe	Pro		
			180					185					190				
Ser	Ala	Phe	Thr	Ile	Lys	Thr	Gly	Glu	Ala	His	Trp	Glu	Leu	Leu	Gly		
		195				200						205					

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Arg	Ala	Arg	Ala	Val	Asp	Thr	Gln	Cys	Tyr	Val	Leu	Met	Pro	Gly	Gln
	210					215					220				
Val	Gly	Met	His	Asp	Leu	Ser	Asp	Pro	Glu	Trp	Glu	Lys	Gln	Ser	His
225					230					235					240
Met	Ser	Ala	Leu	Glu	Lys	Ser	Ser	Arg	Arg	Glu	Ser	Trp	Gly	His	Ser
				245					250					255	
Met	Val	Ile	Asp	Pro	Trp	Gly	Lys	Ile	Ile	Ala	His	Ala	Asp	Pro	Ser
			260					265					270		
Thr	Val	Gly	Pro	Gln	Leu	Ile	Leu	Ala	Asp	Leu	Asp	Arg	Glu	Leu	Leu
		275					280					285			
Gln	Glu	Ile	Arg	Asn	Lys	Met	Pro	Leu	Trp	Asn	Gln	Arg	Arg	Asp	Asp
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Leu	Phe	His													
305															

<210> 5
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 <212> PRT
 <213> S. cerevisiae

<400> 5

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			20					25					30		
Ala	Thr	Phe	Ile	Glu	Arg	Ala	Met	Lys	Glu	Gln	Pro	Asp	Thr	Lys	Leu
		35					40					45			
Val	Val	Leu	Pro	Glu	Cys	Phe	Asn	Ser	Pro	Tyr	Ser	Thr	Asp	Gln	Phe
		50				55					60				
Arg	Lys	Tyr	Ser	Glu	Val	Ile	Asn	Pro	Lys	Glu	Pro	Ser	Thr	Ser	Val
65					70					75				80	
Gln	Phe	Leu	Ser	Asn	Leu	Ala	Asn	Lys	Phe	Lys	Ile	Ile	Leu	Val	Gly
				85					90					95	
Gly	Thr	Ile	Pro	Glu	Leu	Asp	Pro	Lys	Thr	Asp	Lys	Ile	Tyr	Asn	Thr
			100					105					110		
Ser	Ile	Ile	Phe	Asn	Glu	Asp	Gly	Lys	Leu	Ile	Asp	Lys	His	Arg	Lys
		115					120					125			
Val	His	Leu	Phe	Asp	Val	Asp	Ile	Pro	Asn	Gly	Ile	Ser	Phe	His	Glu
	130					135					140				
Ser	Glu	Thr	Leu	Ser	Pro	Gly	Glu	Lys	Ser	Thr	Thr	Ile	Asp	Thr	Lys
145					150					155				160	
Tyr	Gly	Lys	Phe	Gly	Val	Gly	Ile	Cys	Tyr	Asp	Met	Arg	Phe	Pro	Glu
			165						170					175	
Leu	Ala	Met	Leu	Ser	Ala	Arg	Lys	Gly	Ala	Phe	Ala	Met	Ile	Tyr	Pro
		180						185					190		
Ser	Ala	Phe	Asn	Thr	Val	Thr	Gly	Pro	Leu	His	Trp	His	Leu	Leu	Ala
		195					200					205			
Arg	Ser	Arg	Ala	Val	Asp	Asn	Gln	Val	Tyr	Val	Met	Leu	Cys	Ser	Pro
		210				215					220				
Ala	Arg	Asn	Leu	Gln	Ser	Ser	Tyr	His	Ala	Tyr	Gly	His	Ser	Ile	Val
225					230					235				240	
Val	Asp	Pro	Arg	Gly	Lys	Ile	Val	Ala	Glu	Ala	Gly	Glu	Gly	Glu	Glu
				245					250					255	
Ile	Ile	Tyr	Ala	Glu	Leu	Asp	Pro	Glu	Val	Ile	Glu	Ser	Phe	Arg	Gln
			260					265					270		
Ala	Val	Pro	Leu	Thr	Lys	Gln	Arg	Arg	Phe	Asp	Val	Tyr	Ser	Asp	Val
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Asn	Ala	His													
290															

<210> 6

templst

<211> 276
<212> PRT
<213> S. pombe

<400> 6

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Lys	Asn	Leu	Ala	Ile	Cys	Lys	Glu	Leu	Ile	Ser	Gln	Ala	Ala	Ala	Lys
			20					25					30		
Gly	Ala	Lys	Cys	Ile	Phe	Phe	Pro	Glu	Ala	Ser	Asp	Phe	Ile	Ala	His
		35					40					45			
Asn	Ser	Asp	Glu	Ala	Ile	Glu	Leu	Thr	Asn	His	Pro	Asp	Cys	Ser	Lys
		50				55					60				
Phe	Ile	Arg	Asp	Val	Arg	Glu	Ser	Ala	Thr	Lys	His	Ser	Ile	Phe	Val
65					70					75				80	
Asn	Ile	Cys	Val	His	Glu	Pro	Ser	Lys	Val	Lys	Asn	Lys	Leu	Leu	Asn
				85					90					95	
Ser	Ser	Leu	Phe	Ile	Glu	Pro	Leu	His	Gly	Glu	Ile	Ile	Ser	Arg	Tyr
			100					105					110		
Ser	Lys	Ala	His	Leu	Phe	Asp	Val	Glu	Ile	Lys	Asn	Gly	Pro	Thr	Leu
		115					120					125			
Lys	Glu	Ser	Asn	Thr	Thr	Leu	Arg	Gly	Glu	Ala	Ile	Leu	Pro	Pro	Cys
	130					135					140				
Lys	Thr	Pro	Leu	Gly	Lys	Val	Gly	Ser	Ala	Ile	Cys	Phe	Asp	Ile	Arg
145					150					155					160
Phe	Pro	Glu	Gln	Ala	Ile	Lys	Leu	Arg	Asn	Met	Gly	Ala	His	Ile	Ile
				165					170					175	
Thr	Tyr	Pro	Ser	Ala	Phe	Thr	Glu	Lys	Thr	Gly	Ala	Ala	His	Trp	Glu
			180					185					190		
Val	Leu	Leu	Arg	Ala	Arg	Ala	Leu	Asp	Ser	Gln	Cys	Tyr	Val	Ile	Ala
		195					200					205			
Pro	Ala	Gln	Gly	Gly	Lys	His	Asn	Glu	Lys	Arg	Ala	Ser	Tyr	Gly	His
	210					215					220				
Ser	Met	Ile	Val	Asp	Pro	Trp	Gly	Thr	Val	Ile	Ala	Gln	Tyr	Ser	Asp
225					230					235					240
Ile	Ser	Ser	Pro	Asn	Gly	Leu	Ile	Phe	Ala	Asp	Leu	Asp	Leu	Asn	Leu
				245					250					255	
Val	Asp	His	Val	Arg	Thr	Tyr	Ile	Pro	Leu	Leu	Arg	Arg	Asn	Asp	Leu
			260					265					270		
Tyr	Pro	Thr	Ile												
			275												

<210> 7
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<212> PRT
<213> S. pombe

<400> 7

Met	Asn	Ser	Lys	Phe	Phe	Gly	Leu	Val	Gln	Lys	Gly	Thr	Arg	Ser	Phe
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			20					25					30		
Ala	Ser	Ser	Leu	Val	Pro	Lys	Asp	Phe	Arg	Ala	Phe	Arg	Ile	Gly	Leu
		35					40					45			
Val	Gln	Leu	Ala	Asn	Thr	Lys	Asp	Lys	Ser	Glu	Asn	Leu	Gln	Leu	Ala
		50				55					60				
Arg	Leu	Lys	Val	Leu	Glu	Ala	Ala	Lys	Asn	Gly	Ser	Asn	Val	Ile	Val
65					70					75				80	
Leu	Pro	Glu	Ile	Phe	Asn	Ser	Pro	Tyr	Gly	Thr	Gly	Tyr	Phe	Asn	Gln
				85					90					95	
Tyr	Ala	Glu	Pro	Ile	Glu	Glu	Ser	Ser	Pro	Ser	Tyr	Gln	Ala	Leu	Ser
			100					105					110		

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Ser	Met	Ala	Lys	Asp	Thr	Lys	Thr	Tyr	Leu	Phe	Gly	Gly	Ser	Ile	Pro
		115					120					125			
Glu	Arg	Lys	Asp	Gly	Lys	Leu	Tyr	Asn	Thr	Ala	Met	Val	Phe	Asp	Pro
	130					135					140				
Ser	Gly	Lys	Leu	Ile	Ala	Val	His	Arg	Lys	Ile	His	Leu	Phe	Asp	Ile
145					150					155					160
Asp	Ile	Pro	Gly	Gly	Val	Ser	Phe	Arg	Glu	Ser	Asp	Ser	Leu	Ser	Pro
			165						170					175	
Gly	Asp	Ala	Met	Thr	Met	Val	Asp	Thr	Glu	Tyr	Gly	Lys	Phe	Gly	Leu
		180						185					190		
Gly	Ile	Cys	Tyr	Asp	Ile	Arg	Phe	Pro	Glu	Leu	Ala	Met	Ile	Ala	Ala
	195						200					205			
Arg	Asn	Gly	Cys	Ser	Val	Met	Ile	Tyr	Pro	Gly	Ala	Phe	Asn	Leu	Ser
	210					215					220				
Thr	Gly	Pro	Leu	His	Trp	Glu	Leu	Leu	Ala	Arg	Ala	Arg	Ala	Val	Asp
225					230				235						240
Asn	Glu	Met	Phe	Val	Ala	Cys	Cys	Ala	Pro	Ala	Arg	Asp	Met	Asn	Ala
			245						250					255	
Asp	Tyr	His	Ser	Trp	Gly	His	Ser	Thr	Val	Val	Asp	Pro	Phe	Gly	Lys
		260						265					270		
Val	Ile	Ala	Thr	Thr	Asp	Glu	Lys	Pro	Ser	Ile	Val	Tyr	Ala	Asp	Ile
	275						280					285			
Asp	Pro	Ser	Val	Met	Ser	Thr	Ala	Arg	Asn	Ser	Val	Pro	Ile	Tyr	Thr
	290					295					300				
Gln	Arg	Arg	Phe	Asp	Val	Tyr	Ser	Glu	Val	Leu	Pro	Ala	Leu	Lys	Lys
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Glu	Glu														

<210> 8

<211> 1359

<212> DNA

<213> Homo sapien

<220>

<221> misc_feature

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aaggaatgca	gcatatatct	cattggaggc	tctatccctg	aagaggatgc	tgggaaatta	300
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aaaaagccct	aaagtttatg	tttctaattg	gtcacagaat	aggacgatat	gattctacaa	900
cataatcaac	tcctatttaa	attctttaat	gaagaaaaaa	aatttaaaaa	aaaaaaaaaa	960
aacctaggtt	ctctattgag	atgagaaaagc	ctcattatgc	tgacattttc	cacgccacat	1020
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1359

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 35 40 45
 Tyr Ile Val Glu Ala Ala Ser Lys Gly Ala Glu Leu Val Leu Phe Pro
 50 55 60
 Glu Gly Phe Ile Gly Gly Tyr Pro Arg Gly Phe Arg Phe Gly Leu Ala
 65 70 75 80
 Val Gly Val His Asn Glu Glu Gly Arg Asp Glu Phe Arg Lys Tyr His
 85 90 95
 Ala Ser Ala Ile His Val Pro Gly Pro Glu Val Ala Arg Leu Ala Asp
 100 105 110
 Val Ala Arg Lys Asn His Val Tyr Leu Val Met Gly Ala Ile Glu Lys
 115 120 125
 Glu Gly Tyr Thr Leu Tyr Cys Thr Val Leu Phe Phe Ser Pro Gln Gly
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 Gln Phe Leu Gly Lys His Arg Lys Leu Met Pro Thr Ser Leu Glu Arg
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 Cys Ile Trp Gly Gln Gly Asp Gly Ser Thr Ile Pro Val Tyr Asp Thr
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 Pro Thr Ala Asp Gly Ser Lys Glu Trp Gln Ser Ser Met Leu His Ile
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 Ala Ile Glu Gly Gly Cys Phe Val Leu Ser Ala Cys Gln Phe Cys Gln
 225 230 235 240
 Arg Lys His Phe Pro Asp His Pro Asp Tyr Leu Phe Thr Asp Trp Tyr
 245 250 255
 Asp Asp Lys Glu His Asp Ser Ile Val Ser Gln Gly Gly Ser Val Ile
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 Ile Ser Pro Leu Gly Gln Val Leu Ala Gly Pro Asn Phe Glu Ser Glu
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 Gly Leu Val Thr Ala Asp Ile Asp Leu Gly Asp Ile Ala Arg Ala Lys
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